

**BEFORE THE  
STATE CORPORATION COMMISSION  
OF VIRGINIA**

<b>Application of</b>	)	
	)	
<b>Verizon Virginia Inc.</b>	)	<b>Case No. PUC-2007-_____</b>
<b>and</b>	)	
<b>Verizon South Inc.</b>	)	
	)	
<b>For a Determination that Retail Services Are</b>	)	
<b>Competitive and Deregulating and Detariffing</b>	)	
<b>of the Same</b>	)	

**ROANOKE (ROA)**

**EXHIBITS**

**PUBLIC VERSION**

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**ROANOKE (ROA)**

**EXHIBITS**

**Confidential Version**

## **Roanoke (ROA) Exhibits**

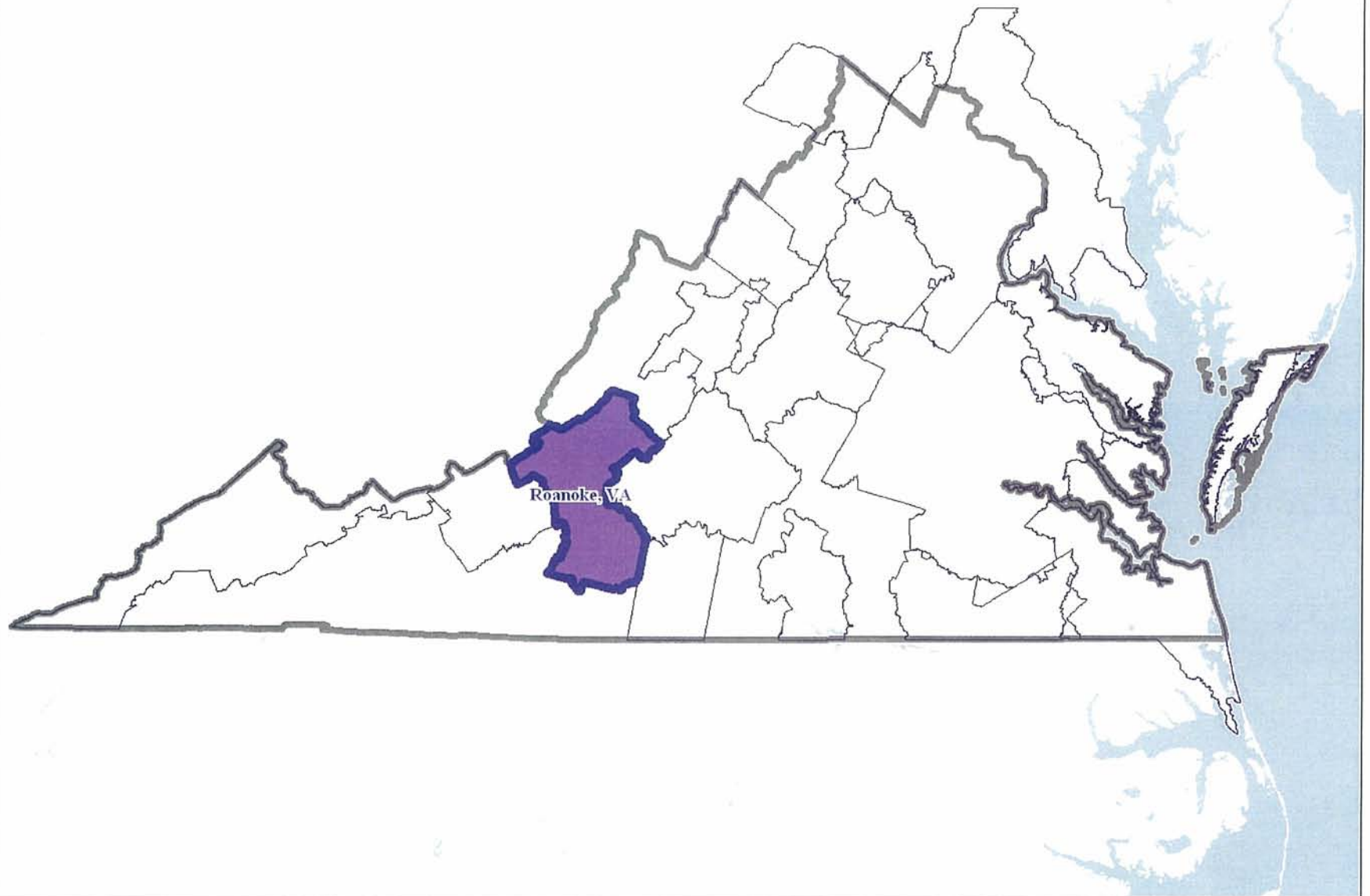
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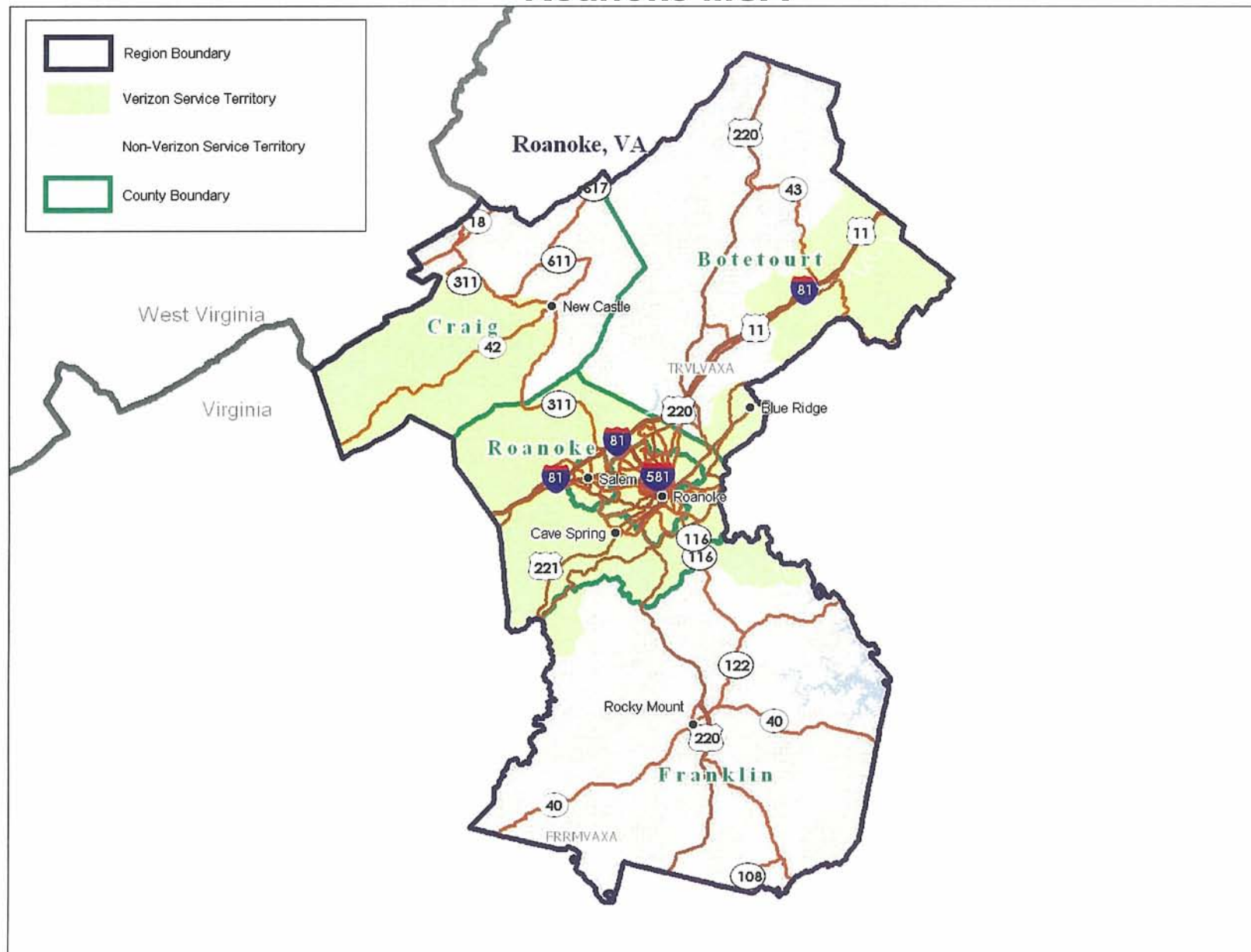
**ROA-1**

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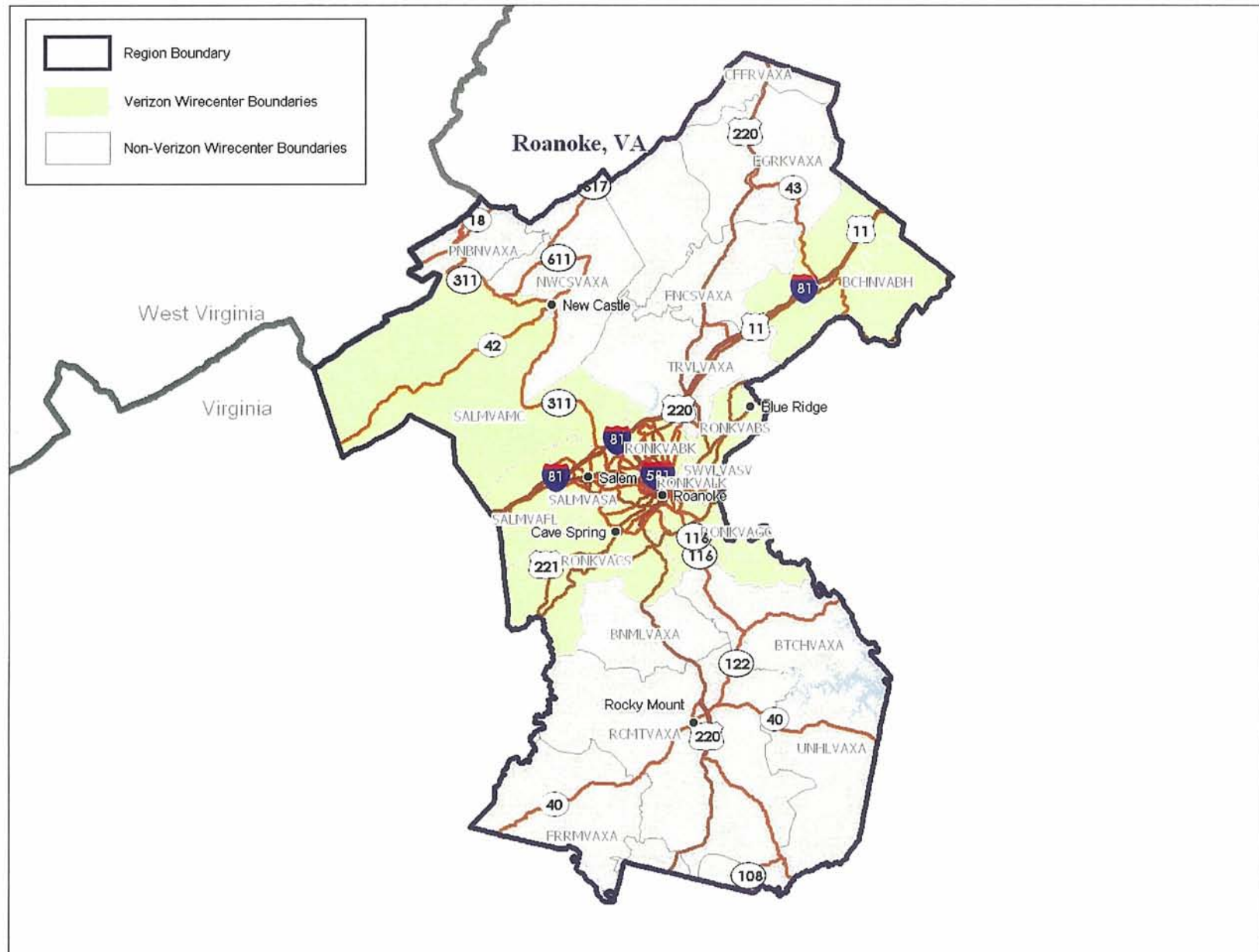
## Roanoke MSA



## Roanoke MSA



# Roanoke MSA



**ROA-2**

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**COMPETITION AND POTENTIAL COMPETITION  
FOR RETAIL TELECOMMUNICATIONS SERVICES IN  
VERIZON'S ROANOKE MSA  
SERVICE TERRITORY**

Report of Jeffrey A. Eisenach, Ph.D.  
January 17, 2007

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## I. OVERVIEW

Verizon's service territory in the Roanoke MSA consists of 678 square miles, with a population of 220,431 living in 93,374 households as of 2006; there are 9,273 business establishments.<sup>1</sup> The average population density is 325 residents per square mile, and the median household income is \$47,505.<sup>2</sup> Verizon operates ten wire centers in the region.<sup>3</sup>

The Roanoke MSA is located in the 540 area code, and includes portions of Botetourt, Craig and Roanoke counties. It is a mix of rural and urban areas: The region's most sparsely populated wire center, Mason Cove (SALMVAMC), has 27 persons per square mile; the most densely populated wire center is Luck Avenue (RONKVALK), with a density of 2,391 persons per square mile.<sup>4</sup> I-81 runs through the region from northeast to southwest. The Buchanan wirecenter, located in the northeastern portion of the Roanoke MSA, is not contiguous with the other Verizon wire center territories in the region, but is contiguous with the Bedford and Stewartsville wire centers, which are included in the Lynchburg MSA.<sup>5</sup>

Competition for telecommunications services is intense throughout the Roanoke MSA. Facilities-based wireline competition is extensive, both from traditional CLECs such as [BEGIN CONFIDENTIAL] [END CONFIDENTIAL] and from cable providers, including most significantly [BEGIN CONFIDENTIAL] [END CONFIDENTIAL] which offers cable telephony service throughout its franchise area, covering more than 80 percent of all households.<sup>7</sup> [BEGIN CONFIDENTIAL]

[BEGIN CONFIDENTIAL] of all wireline telephone lines are now served by carriers other than Verizon, and the percentage is growing rapidly.

Mobile wireless coverage is ubiquitous, and [BEGIN CONFIDENTIAL]

[END CONFIDENTIAL] consider their cell phone their primary telephone. As for broadband, nearly all customers have access to cable modem service, as well as to competitive DSL services from CLECs such as NTELOS and Telcove. Fixed wireless providers also serve the region, including B2X.

There are no barriers to entry. Significant entry has already occurred and more is underway. Charter and Comcast are expected to deploy cable telephony within the next 12 months, and in any case could do so at any time with little or no additional investment. Access to fiber is available from multiple competitors, including Cavalier, Continental Visi-Net, NTELOS and ValleyNet.

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1. See Exhibit ROA-4.

2. See *id.*

3. See Exhibit ROA-3.

4. See Exhibit ROA-4.

5. See Exhibit ROA-1.

6. See Exhibit ROA-14.

7. See Exhibit VA-10.

The analysis below of the availability and usage of existing alternative services, and of the conditions associated with potential competition and new entry, demonstrates that competition already regulates the prices of Verizon's retail telephony services in the Roanoke MSA, and that further entry and even more intense competition is a virtual certainty.

## II. AVAILABILITY OF ALTERNATIVE SERVICES

All 93,374 households in the Roanoke region and all 9,273 businesses in the Roanoke region have the option to obtain alternatives to Verizon's BLETs, OLETs and Bundled Services from competitive providers. Facilities-based competition is widespread, and includes both traditional CLECs and cable providers, but a large number of CLECs also provide services through resale and/or Wholesale Advantage agreements. Mobile telephone service is ubiquitous, and broadband service is nearly so.

### A. Traditional CLECs<sup>8</sup>

Traditional CLECs provide robust competition throughout the Roanoke MSA, and facilities-based competition is widespread.

[BEGIN CONFIDENTIAL]

[END CONFIDENTIAL]<sup>10</sup>

[BEGIN CONFIDENTIAL]

[END CONFIDENTIAL]<sup>11</sup>

In addition, all households and businesses in the Roanoke MSA can receive service from traditional CLECs through resale and/or Wholesale Advantage services available from Verizon.<sup>12</sup> As of March 2006, [BEGIN CONFIDENTIAL]

- 
8. Here and in the remaining sections of this report, unless otherwise indicated, "traditional CLEC" refers to CLECs other than cable companies. "CLEC" refers to both traditional CLECs and cable companies.
  9. See Exhibit ROA-15 and Exhibit ROA-17. The E911 data includes lines that are unable to be assigned to a wire center. These unassignable lines are included in the aggregate competition information. This leads to some under representation of E911 lines when broken out by wire center.
  10. See Exhibit ROA-4 and Exhibit ROA-15.
  11. See *id.*
  12. See Exhibit ROA-16.
  13. See Exhibit ROA-15.



[END CONFIDENTIAL]

Altogether, a total of [BEGIN CONFIDENTIAL]

[END CONFIDENTIAL]<sup>15</sup>

## B. Cable Telephony

Three cable companies serve the Roanoke MSA, Comcast (which purchased Adelphia's franchise territories), Charter, and Cox.<sup>16</sup> Cox's service territory covers 81.8 percent of households, Comcast's territory includes 13.9 percent of the households in the Roanoke MSA, and Charter's service territory includes 2.5 percent of the households.<sup>17</sup>

Cox offers cable telephony throughout its service territory. Both the Comcast and Charter infrastructures are capable of providing cable telephony service, and both companies have announced plans to deploy cable telephony in the very near future.<sup>18</sup>

## C. Mobile Telephony

Of the 93,374 households in the Roanoke MSA, all but 2 have access to at least one CMRS provider, and all but 1,661 (1.8 percent) had access to two or more carriers.<sup>19</sup> In addition to Verizon Wireless, there are six CMRS providers offering retail telephone services in the Roanoke MSA. They are Alltel, Cingular, NTELOS, Sprint, T-Mobile, and US Cellular.<sup>20</sup>

As of 2006, there are 40 cellular towers in the Roanoke MSA.<sup>21</sup> Of these, five have been constructed since 2004.<sup>22</sup> There is at least one cellular tower located in the area served by eight of the ten Verizon wire centers.<sup>23</sup>

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14. See Exhibit ROA-15.

15. See Exhibit ROA-14.

16. See Exhibit VA-10 and ROA-9.

17. See *id.*

18. See West Testimony at 42. See also Comcast, FAQ, <https://www.comcast.com/Customers/FAQ/FaqDetails.ashx?Id=3804> (last visited Dec. 3, 2006); *id.* at <https://www.comcast.com/Customers/FAQ/FaqDetails.ashx?Id=3807> (last visited Dec. 3, 2006).

19. See Exhibit ROA-12.

20. See Exhibit ROA-11.

21. See Exhibit ROA-10.

22. See *id.*

23. Compare Exhibit ROA-3 and Exhibit ROA-10.

#### D. Broadband and VoIP

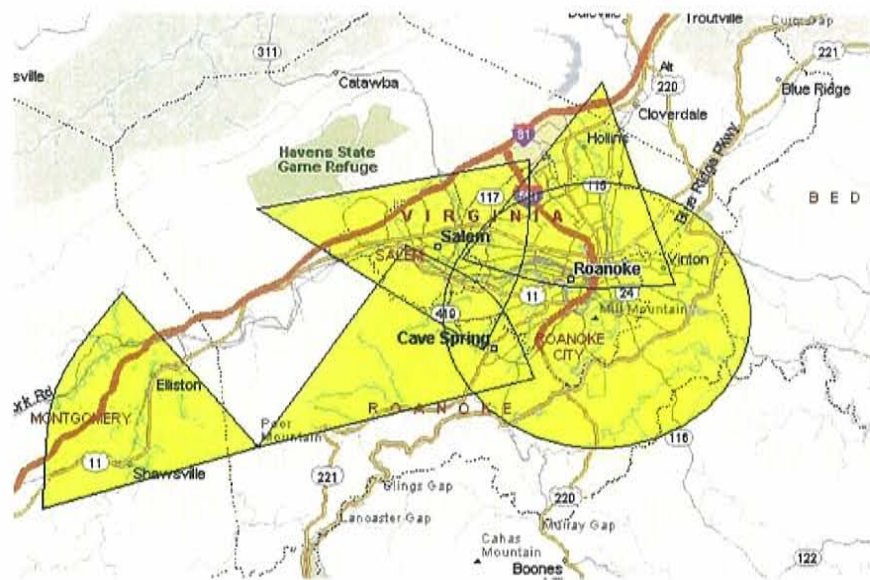
Increasingly, consumers are choosing to combine stand-alone broadband Internet access with VoIP services provided by “bring your own access” companies such as Vonage, thus creating their own bundles of broadband and retail telephony services. Both broadband and VoIP services are available to the vast majority Roanoke MSA households and businesses.

Cable Modem and DSL Service: All three cable providers, Comcast, Charter, and Cox, offer cable modem service throughout their service territories in the Roanoke MSA,<sup>24</sup> serving 96.2 percent of all residences.<sup>25</sup> In addition, Verizon makes DSL service without voice available to retail customers for \$26.99 per month. [BEGIN CONFIDENTIAL] [END CONFIDENTIAL] of households have access to DSL services.

Fixed Wireless Service: In addition to wireline cable modem and DSL, a vast majority of households (91 percent) have access to fixed wireless broadband services.<sup>26</sup> Providers include:

- B2X: As indicated in Figure 1 below, B2X utilizes Motorola’s Canopy technology to provide fixed wireless broadband to the Roanoke MSA as well as the Blacksburg-Radford-Christiansburg MSAs.<sup>27</sup> B2X is based in Roanoke and currently has service coverage in Montgomery country in the BCR MSA. Residential service is available, offering 1MB of bandwidth in each direction, for \$42.50 per month.<sup>28</sup>

Figure 1: B2X Service Territory in the Roanoke MSA



24. See Exhibit VA-10 and ROA-8.

25. See *id.*

26. See Exhibit VA-4.

27. See B2X, Availability, <http://www.b2xonline.com/availability.asp> (last visited July 21, 2006).

28. See *id.* at <http://www.b2xonline.com/speed.asp> (last visited July 21, 2006).



- Kimbanet: Kimbanet offers fixed wireless broadband to the Roanoke MSA.<sup>29</sup> The residential service offers 512 Kbps for \$74.95 per month. Business class is over 1 Mbps for \$150.00 per month.<sup>30</sup>
- NetWave Internet: NetWave Internet offers fixed wireless broadband services to the Roanoke MSA. They offer residential and business solutions, and prices can be obtained by contacting a customer service representative.<sup>31</sup>
- Rev.Net: Rev.Net provides fixed wireless broadband services to residential and business customers in the Roanoke MSA. Rev.Net pricing is \$34.95 per month for residential Beam Access Wireless Broadband and \$99.95 per month for Corporate Class Broader Band.<sup>32</sup>

While some of the firms discussed, such as Cox, above offer bundles that include VoIP services, customers also have the option of purchasing alternatives to Verizon's BLETS, OLETS and Bundled Services from by-pass VoIP companies. VoIP providers that offer telephone numbers in the 540 area code include Vonage, Net2Phone, Packet 8, and Sun Rocket.<sup>33</sup>

#### **E. Overall Availability of Alternative Platforms and Competitors**

Looking overall at the availability of service from alternative platform providers (i.e., from mobile wireless, cable modem, DSL, facilities-based CLECs, fixed wireless and BPL), 100 percent of all households in the ROA MSA have service available from at least one alternative platform provider and 91 percent have service from four or more alternative platforms.<sup>34</sup>

Similarly, looking overall at the availability of service from all competitors – i.e., the same measure as above, but counting each competitor separately (e.g., counting each CMRS provider separately), competition is even more extensive: 99 percent of households have competitive alternatives from at least two competitors, and 96 percent have access to service from eight or more Verizon competitors.<sup>35</sup>

### **III. USAGE OF ALTERNATIVE SERVICES**

Verizon's internal data shows that at least [BEGIN CONFIDENTIAL] [END CONFIDENTIAL] of wireline telephone lines in the ROA region were being served by competitors as of March 2006, and past trends would indicate that that proportion would have increased in the intervening months. However, these figures understate the true market share of competitors, since they fail to account for intermodal competition, such as from wireless and broadband.

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29. Kimbanet, Wireless Service, <http://www.kimbanet.com/wirelessservice.asp> (last visited July 21, 2006).

30. See *id.*

31. Netwave, Wireless Access, [www.netwaveinternet.net](http://www.netwaveinternet.net) (last visited Nov. 22, 2006).

32. See RevNet, [www.rev.net](http://www.rev.net) (last visited Nov. 22, 2006).

33. See West Testimony at 81.

34. See Exhibit VA-4 and Exhibit ROA-5.

35. See Exhibit VA-5 and Exhibit ROA-6.

Survey data indicates that [BEGIN CONFIDENTIAL]

[END CONFIDENTIAL] of households subscribe to broadband. Taking intermodal competition into account, the data presented below show that Verizon voice lines now account for only 34.7 percent of all wireline telephony, wireless telephony and broadband connections in the region.

Time series data presented at the end of this section also shows that Verizon's wireline market share is falling, both in proportion to the number of wirelines served and relative to the number of households in the region. Taken together, the data presented in detail below demonstrates that the competitive alternatives described in Section II represent viable alternatives for Verizon's BLETS, OLETS and Bundled Services in the ROA region, since customers are actually switching to them in large numbers.

#### A. Traditional CLECs and Cable Telephony

As detailed in Exhibit ROA-15, a total of [BEGIN CONFIDENTIAL] 35 CLECs were

[END CONFIDENTIAL]

These figures are consistent with the survey data presented by Mr. Newman, which shows that [BEGIN CONFIDENTIAL] [END CONFIDENTIAL] of residential customers in the Roanoke MSA are using providers other than Verizon.<sup>39</sup> In small MSAs (including the Roanoke MSA), the survey data shows that 20.3 percent of POTS business customers and 29.9 percent of all business customers are using other providers.<sup>40</sup>

Exhibit ROA-15 also demonstrates that wireline competition is ubiquitous throughout the Roanoke MSA. It shows that competitors are actually serving both business and residential customers in [BEGIN CONFIDENTIAL] [END CONFIDENTIAL] of the ten wire centers in the Roanoke MSA, including the smallest and most rural wire centers and are using their own last-mile facilities in [BEGIN CONFIDENTIAL]

[END CONFIDENTIAL] These data demonstrate that alternatives to Verizon's BLETS, OLETS and Bundled Services from wireline competitors are available and in widespread use by both residential and enterprise customers throughout the Roanoke MSA.

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36. This figure does not include approximately six percent of the population (who by definition were not reached through Verizon's telephone survey) who have cut the cord altogether. See West Testimony at 63.

37. See Exhibit ROA-15.

38. See Exhibit ROA-19.

39. See Exhibit VA-21.

40. See Exhibit VA-20.



## **B. Mobile Telephony**

The survey data presented by Mr. Newman shows that [BEGIN CONFIDENTIAL] [END CONFIDENTIAL] of households in the Roanoke MSA purchase telephone service from mobile telephone companies.<sup>41</sup> Moreover, [BEGIN CONFIDENTIAL]

[END CONFIDENTIAL]<sup>42</sup>

While Mr. Newman's testimony does not provide data on business usage of mobile telephones specifically for the Roanoke MSA, it does indicate that the proportion of businesses in small MSAs (including the Roanoke MSA) which purchase mobile telephone service is 50.8 percent,<sup>43</sup> and that 15.5 percent of business respondents consider their mobile telephone to be their primary means of voice communication.<sup>44</sup>

These figures do not include mobile telephone customers who have dropped their wireline service altogether, as these customers were not eligible for the telephone survey. As Mr. West's testimony indicates, national estimates suggest approximately six percent of residential customers have "cut the cord."<sup>45</sup>

Again, these figures demonstrate that the mobile wireless alternatives available to consumers in the Roanoke MSA function as actual, viable alternatives to Verizon's BLETS, OLETS and Bundled Services.

## **C. Broadband and VoIP**

The survey data presented by Mr. Newman show that [BEGIN CONFIDENTIAL]

[END CONFIDENTIAL]<sup>46</sup>

These data demonstrate that the cable companies in the Roanoke MSA have been successful in selling at least the second (data) leg of their triple play offerings, despite the widespread availability of DSL from multiple providers, showing the magnitude of the competitive challenge facing Verizon as it tries to retain customers in the face of cable's triple play cable telephony offerings.

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41. See Exhibit VA-21.

42. See *id.*

43. See Exhibit VA-20.

44. See *id.*

45. See West Testimony at 65.

46. See Exhibit VA-21.

The survey data presented by Mr. Newman show that in small MSAs in Virginia (including the Roanoke MSA), 59.1 percent of businesses subscribe to high-speed broadband service.<sup>47</sup>

These overall usage rates for broadband demonstrate that the broadband plus VoIP “build your own bundle” option is available today to [BEGIN CONFIDENTIAL] [END CONFIDENTIAL] of residential customers and six in ten businesses in the Roanoke MSA, which are already signed up for broadband.

#### **D. Overall Penetration of Wireline and Intermodal Competition**

While it is not possible to estimate precisely the number of lines Verizon has lost to wireline and intermodal competitors, it is clear that competition is having a significant impact on Verizon’s market share, both in terms of wireline telephony and the overall markets for BLETs, OLETs and bundled services, and that wireline competitors are winning a growing proportion of customers. The data also indicate that intermodal competitors are winning a growing proportion of customers from wireline carriers of all types (i.e., including both Verizon and the traditional CLECs and cable telephony providers).

Both Verizon’s line count and its wireline market share in the Roanoke MSA are dropping rapidly. As indicated in Figure 2 below, between December 2003 and March 2006 (i.e., in 27 months), the ratio of Verizon lines to households fell from [BEGIN CONFIDENTIAL] [END CONFIDENTIAL]<sup>48</sup> to [END CONFIDENTIAL]<sup>49</sup>

During this same 27-month period, the number of residential wirelines served by wireline CLECs rose by [BEGIN CONFIDENTIAL]

[END CONFIDENTIAL]<sup>50</sup>

Figure Two also demonstrates the significance of intermodal competition from wireless telephony and from broadband plus VoIP “build you own” bundles. It shows that the ratio of combined Verizon and CLEC residential lines to households fell from [BEGIN CONFIDENTIAL]

[END CONFIDENTIAL]<sup>51</sup> Assuming people have not stopped using

47. See Exhibit VA-20.

48. See Exhibit ROA-4 and Exhibit ROA-19.

49. See Exhibit ROA-19.

50. See *id.*

51. See *id.*

52. See *id.*

53. See *id.*

54. See *id.*

voice telephony altogether, these data clearly indicate that wireless and broadband providers are competing effectively with both Verizon and other traditional wireline providers – a conclusion which is consistent with the high rates of wireless telephony usage and broadband adoption discussed above.

**[BEGIN CONFIDENTIAL]**

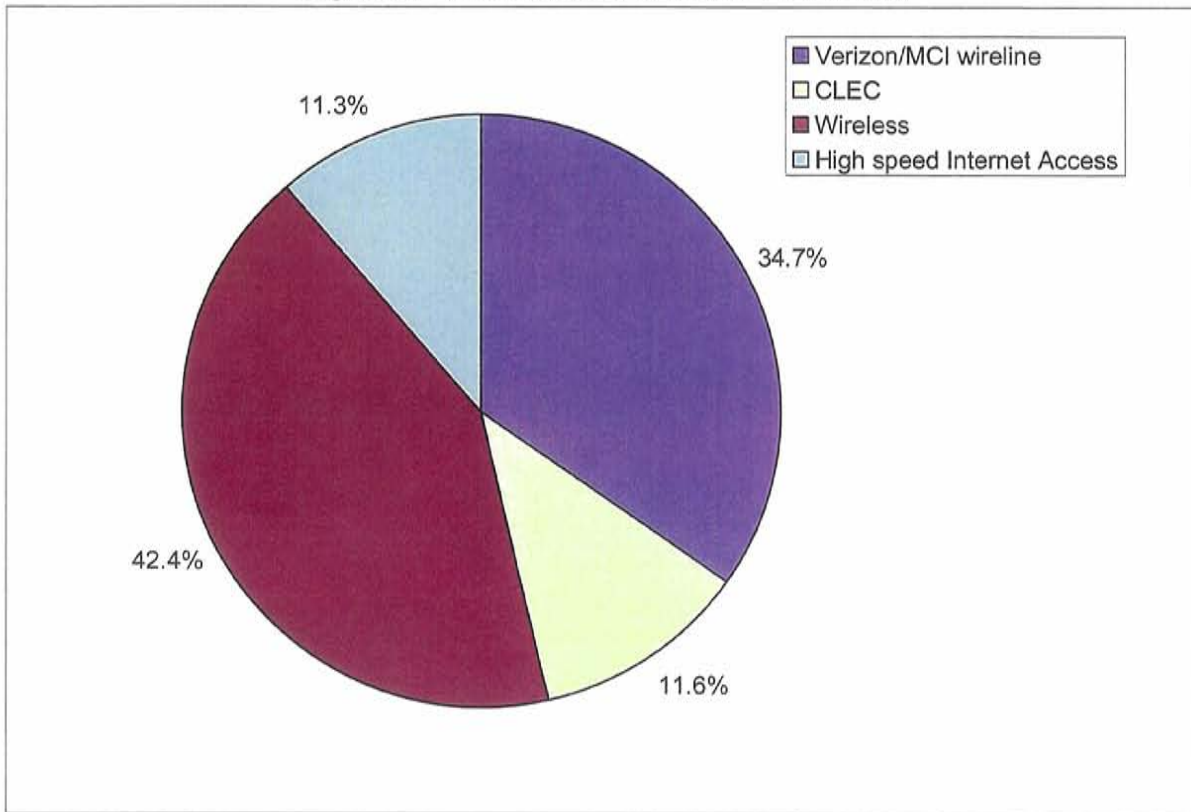
**[END CONFIDENTIAL]**

Another perspective on Verizon's loss of overall share is shown in Figure 3 below, which shows the percentage of total connections – including wireline telephony, wireless telephony and broadband connections – served by Verizon, based on the survey conducted by Mr. Newman. As the figure shows, Verizon voice lines now account for only 34.7 percent of all wireline telephony, wireless telephony and broadband connections.<sup>55</sup>

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55. See Exhibit VA-22.

Figure 3: Verizon Share of Total Connections



#### IV. POTENTIAL COMPETITION AND ENTRY

While it is clear from the evidence presented above that actual competition already in the marketplace is extensive, even in the absence of additional entry, it is equally clear that entry has occurred, is occurring and is likely to continue occurring in the future. Competition in the Roanoke MSA is thus certain to become even more intense in the coming months and years.

First, both Comcast and Charter are committed to deploying cable telephony services in the region in the near future.<sup>56</sup> Once these deployments are complete, nearly 96 percent of all households in the Roanoke MSA will have access to cable telephony.<sup>57</sup>

Facilities-based companies are also well-positioned to expand their offerings. **[BEGIN CONFIDENTIAL]**

**[END CONFIDENTIAL]** In addition, it

56. Charter customer service representatives confirmed this telephony rollout plan. See West Testimony at 55-56. See Comcast, FAQ, <https://www.comcast.com/Customers/FAQ/FaqDetails.ashx?Id=3804> (last visited Dec. 3, 2006); *id.* at <https://www.comcast.com/Customers/FAQ/FaqDetails.ashx?Id=3807> (last visited Dec. 3, 2006).

57. See Exhibit ROA-10.

is worthy to note that NTELOS, which already provides mobile wireless service in the area, was among the successful bidders in the recent AWS auction. Given that the company is already offering its “portable broadband” product in the neighboring areas of Lexington and Lynchburg, the company could easily use this additional spectrum to expand its portable broadband coverage to Roanoke.<sup>58</sup>

It is also worth noting that a Spectrum Co., a joint venture between Sprint and cable providers Comcast, Cox, TimeWarner and Advance/Newhouse,<sup>59</sup> was also a successful bidder in the AWS spectrum auction.<sup>60</sup> The Sprint-Cable consortium is already test-marketing quadruple-play services in several markets, and its acquisition of spectrum in the Roanoke MSA gives it the option to enter this region as well.

Of course, the availability of resale and/or Wholesale Advantage services purchased from Verizon gives virtually any CLEC the option to enter the market or expand its service area in the region. In the event of a price increase by Verizon, these companies could and would accommodate customers wishing to switch away from Verizon’s services.

More broadly, barriers to entry in the Roanoke MSA are extremely low. The Roanoke MSA has extensive access to high-capacity fiber optic cable, both long haul and metro fiber, with multiple long-haul POPs, from companies such as Cavalier, Continental VisiNet, NTELOS and ValleyNet.<sup>61</sup> The widespread presence of cell towers throughout the region (there are towers in eight of the ten wire center areas, and four new towers have been constructed since 2004) means that the mobile and fixed wireless entry is also inexpensive. Finally, a significant portion of the land area is rural, and thus potentially eligible for funding from the RUS. Moreover one of four counties in the Roanoke MSA (Franklin) is eligible for support from the Tobacco Commission.<sup>62</sup> Botetourt and Craig counties are also eligible for support from the Appalachian Regional Commission.<sup>63</sup>

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58. See FCC, Auction 66 – Advanced Wireless Services (AWS -1), available at [http://wireless.fcc.gov/auctions/default.htm?job=auction\\_summary&id=66](http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=66) (last visited Nov. 21, 2006).

59. Susan Rush, *Sprint Cable JV Details AWS Win*, WIRELESS WEEK, Oct. 5, 2006, available at <http://www.wirelessweek.com/toc-newsat2/2006/20061005.html>.

60. See FCC, Auction 66 – Advanced Wireless Services (AWS -1), available at [http://wireless.fcc.gov/auctions/default.htm?job=auction\\_summary&id=66](http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=66) (last visited Nov. 21, 2006).

61. See Eisenach Testimony at III.B. and Exhibit VA-18.

62. The projects most likely to be funded, according to the Tobacco Commission’s application, would (1) create a fiber-optic network that spans the region, (2) connect the region’s extant fiber-optic networks to national and global networks, (3) create service access at strategic aggregation points across the region, and (4) deploy optical and wireless technologies for community infrastructure that reflect the best technical and economical choices available. See Virginia Tobacco Indemnification and Community Revitalization Commission, Technology Grant Program: Guidelines, Instructions, and Application 3 (2006), available at <http://www.vatobaccocommission.org>. Tobacco Commission eligible areas include independent cities located within the named counties.

63. See Appalachian Regional Commission, Counties in Appalachia, <http://www.arc.gov/index.do?nodeId=27> (last visited Dec. 3, 2006).



## V. CONCLUSION

Competition for retail telephone services in the Roanoke MSA is intense and certain to become more intense in coming years. By every measure, Verizon is already losing customers to traditional CLECs, cable telephony providers and intermodal competitors at a rapid pace, and this decline is taking place *at current prices*. If Verizon were to raise prices, it would both accelerate the rate at which it is losing customers to existing competitive services, and increase the rate at which competitors and potential competitors deploy new services in the market.<sup>64</sup> The current state of competition is already adequate to regulate the price of Verizon's retail telephone services in this region, and continuing entry is certain to further erode its competitive position.

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64. An analysis conducted by Mr. Taylor estimates that a decision by Verizon to raise prices by 5 percent in the Roanoke MSA would result in a *net* revenue loss of more than [BEGIN CONFIDENTIAL] [END CONFIDENTIAL] annually. See Taylor Testimony, Table 14 at 94.

**ROA-3**

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### Wire Centers by Rate Group, Exchange, City and County

REGION	LOC ST	WIRECENTER	LOCATION NAME	Rate Group	Exchange	CENTRAL OFFICE CITY	COUNTY
ROANOKE	VA-E	BCHNVABH	BUCHANAN VA	07	BUCHANAN	BUCHANAN	Botetourt
		RONKVABK	BARKLEY AVENUE VA	07	ROANOKE	ROANOKE	Roanoke City
		RONKVABS	BONSACK VA	07	ROANOKE	ROANOKE	Botetourt
		RONKVACS	CAVE SPRING VA	07	BENT MOUNTAIN/ROANOKE	ROANOKE	Roanoke
		RONKVACV	COVE ROAD VA	07	ROANOKE	ROANOKE	Roanoke
		RONKVAGC	GARDEN CITY VA	07	ROANOKE	ROANOKE	Roanoke
		RONKVALK	LUCK AVENUE VA	07	ROANOKE	ROANOKE	Roanoke City
		SALMVAFL	FORT LEWIS VA	07	SALEM	FORT LEWIS	Roanoke
		SALMVAMC	MASON COVE VA	07	SALEM	SALEM	Roanoke
		SALMVASA	SALEM VA	07	ROANOKE/SALEM	SALEM	Salem City



**ROA-4**

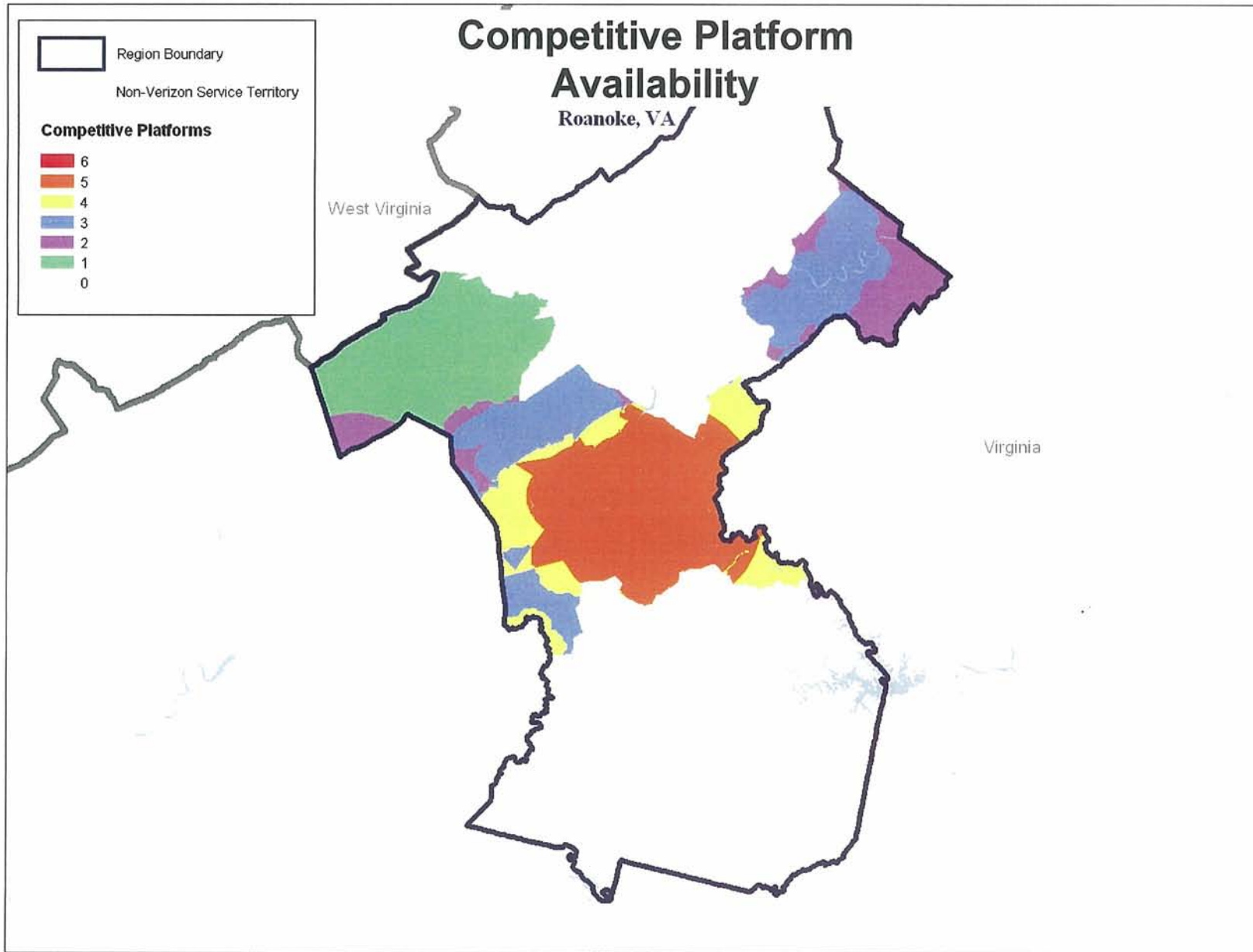
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**CONFIDENTIAL**

**EXHIBIT** ROA-4

**ROA-5**

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**Exhibit ROA-5**

**ROA-6**

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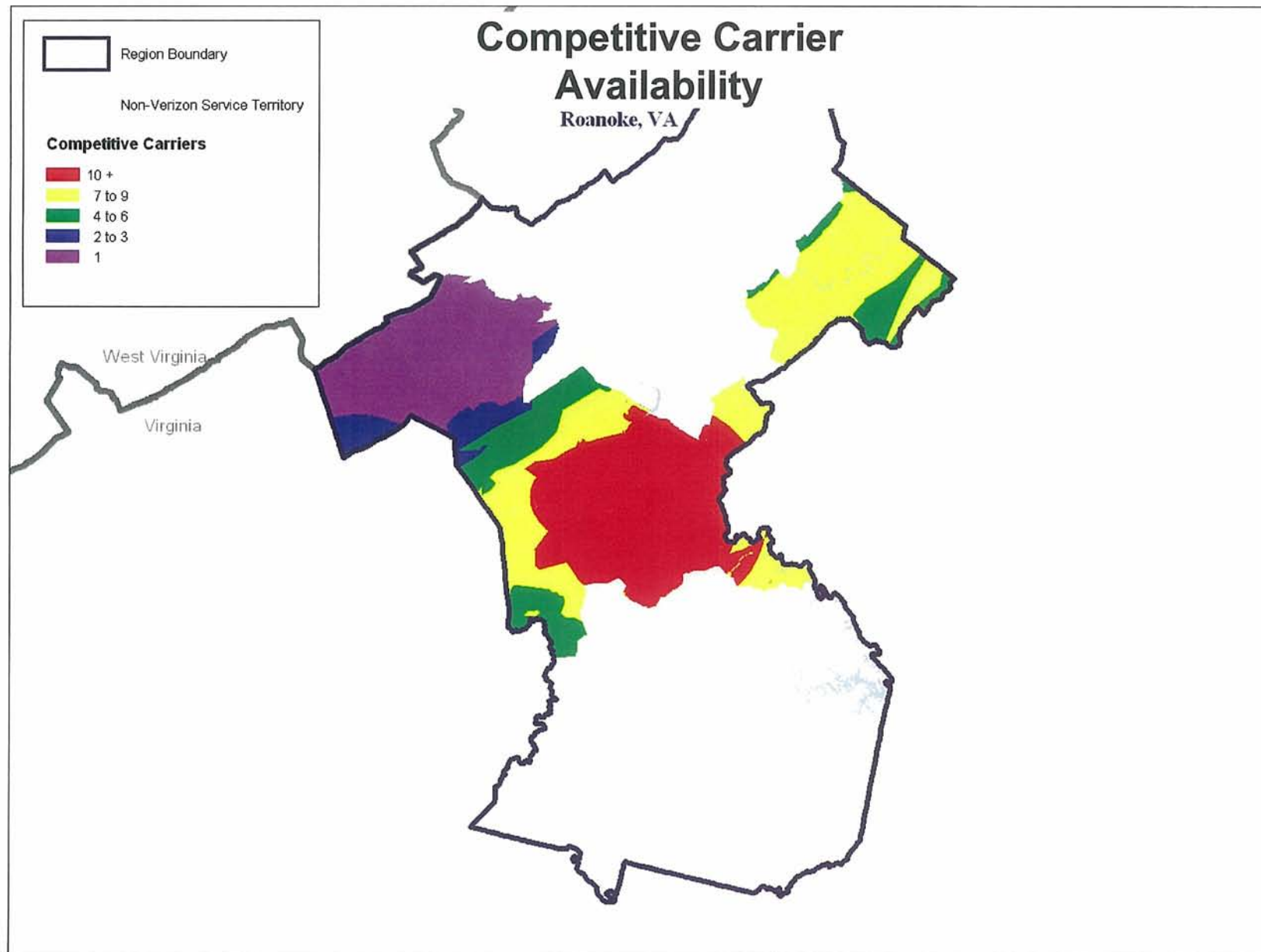
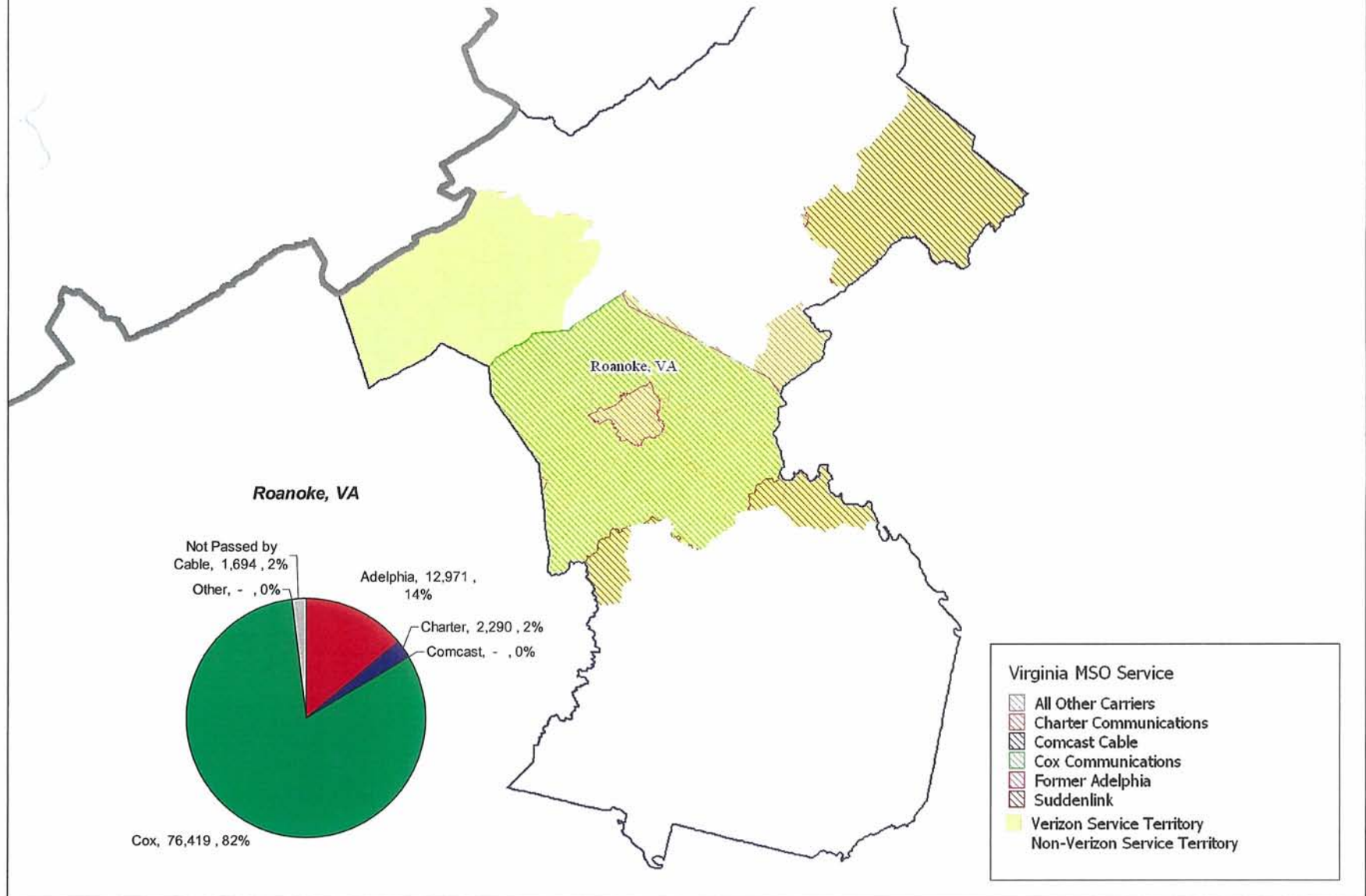


Exhibit ROA-6

**ROA-7**

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## Cable Availability



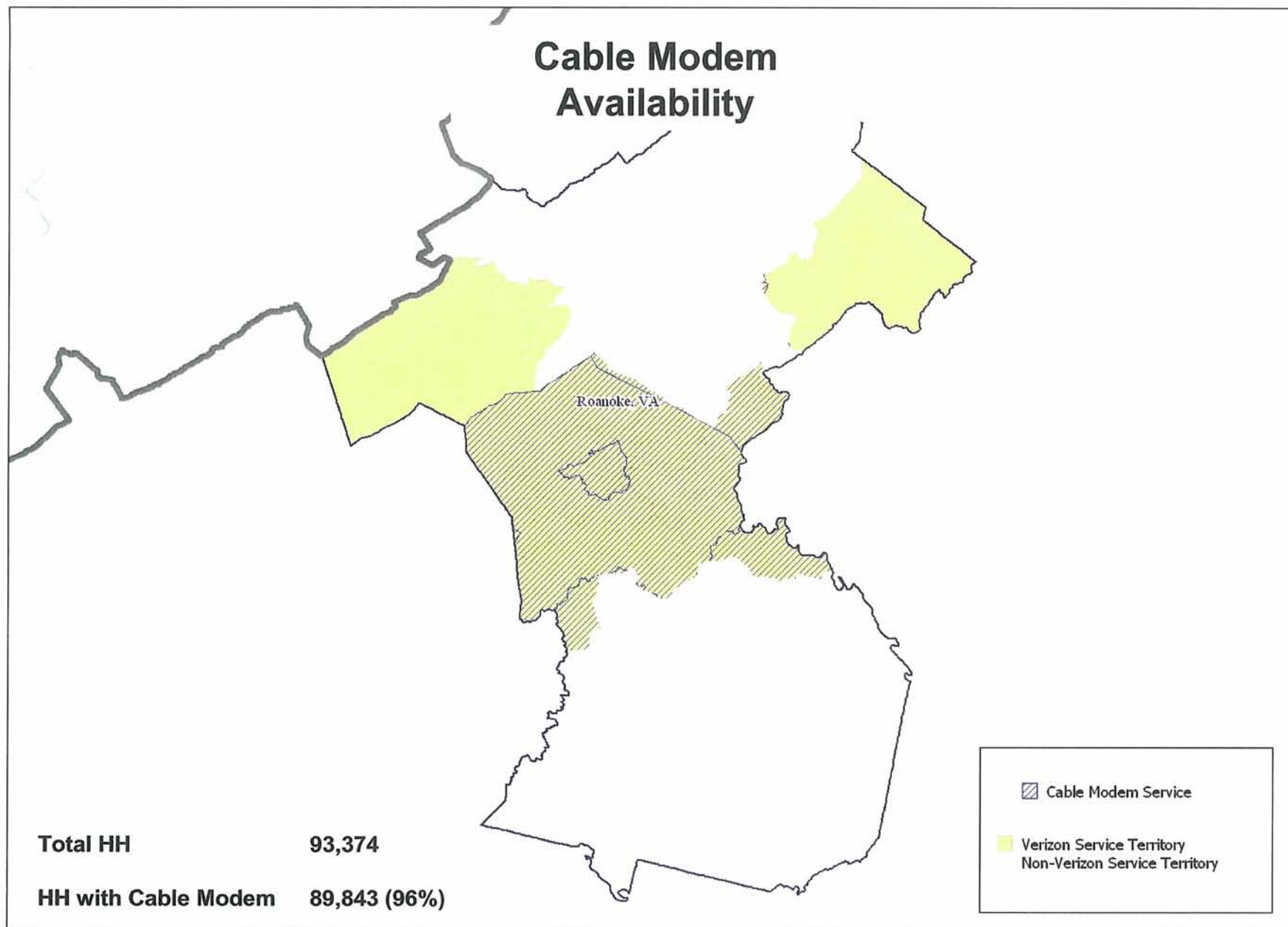
**Exhibit ROA-7**

Note: HH numbers reflect only those households in Verizon's Service Territory



**ROA-8**

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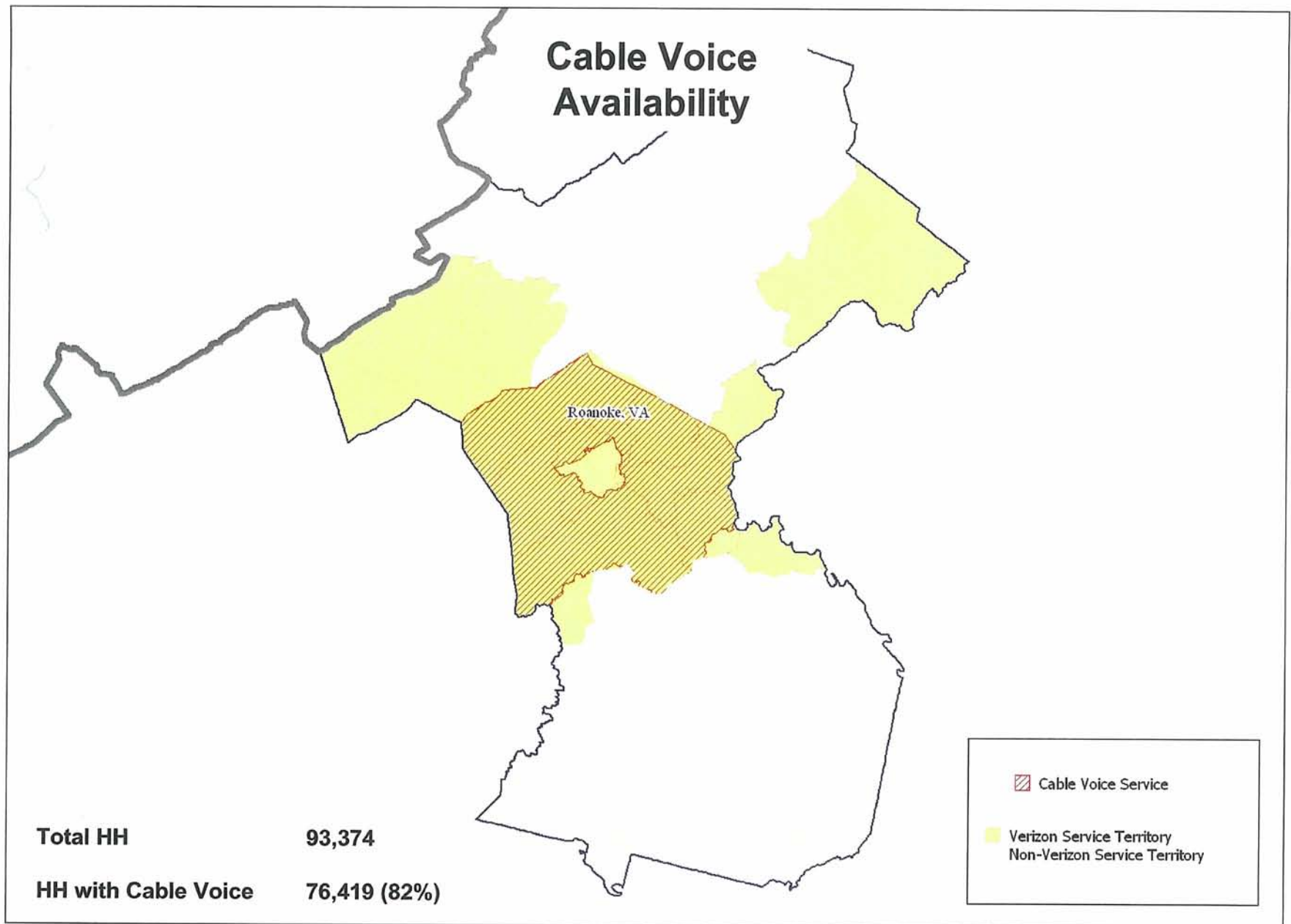


**Exhibit ROA-8**

Note: HH numbers reflect only those households in Verizon's Service Territory

**ROA-9**

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**Exhibit ROA-9**

Note: HH numbers reflect only those households in Verizon's Service Territory

**ROA-10**

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## Wireless Tower Locations by Year Constructed

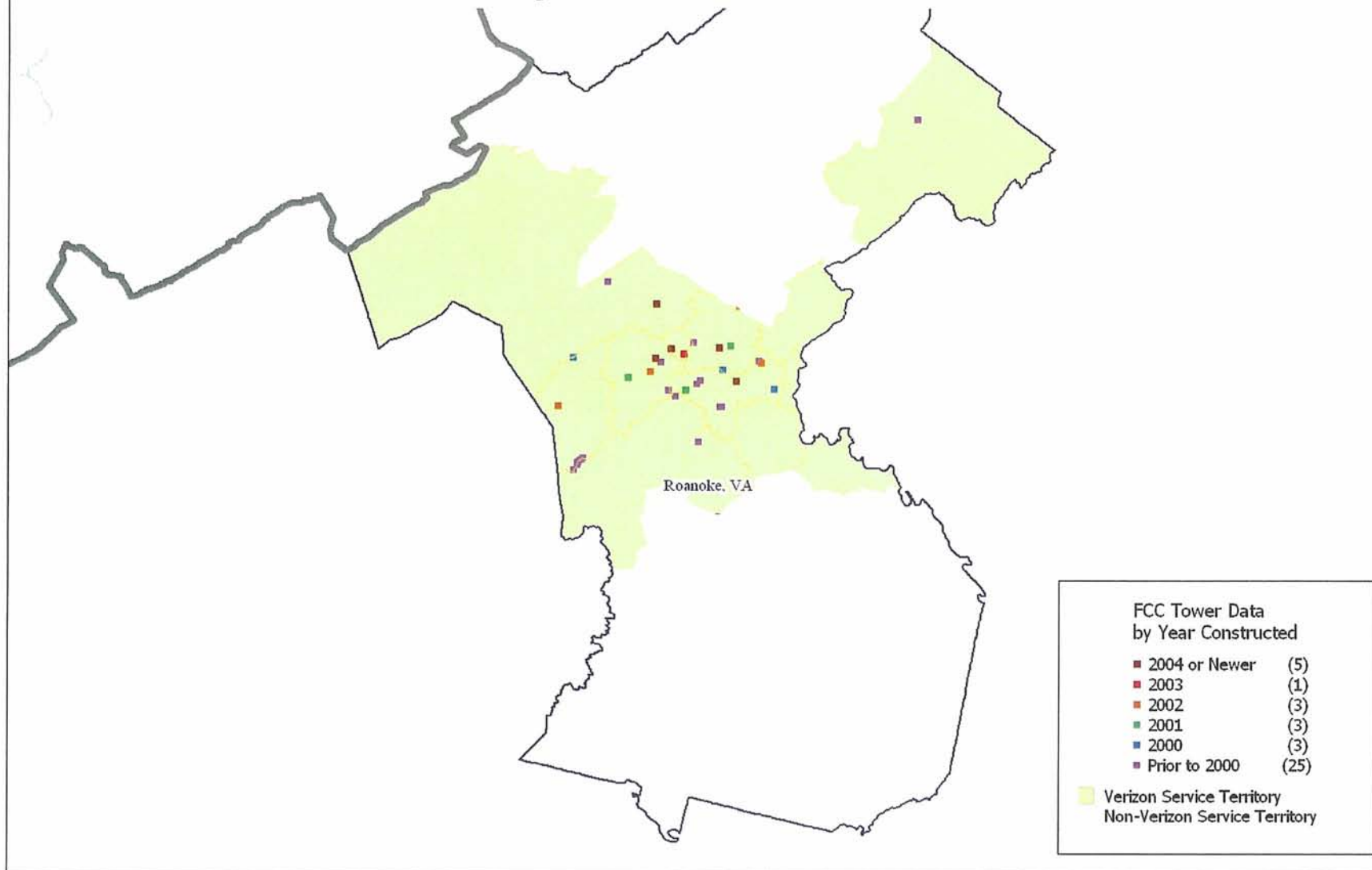
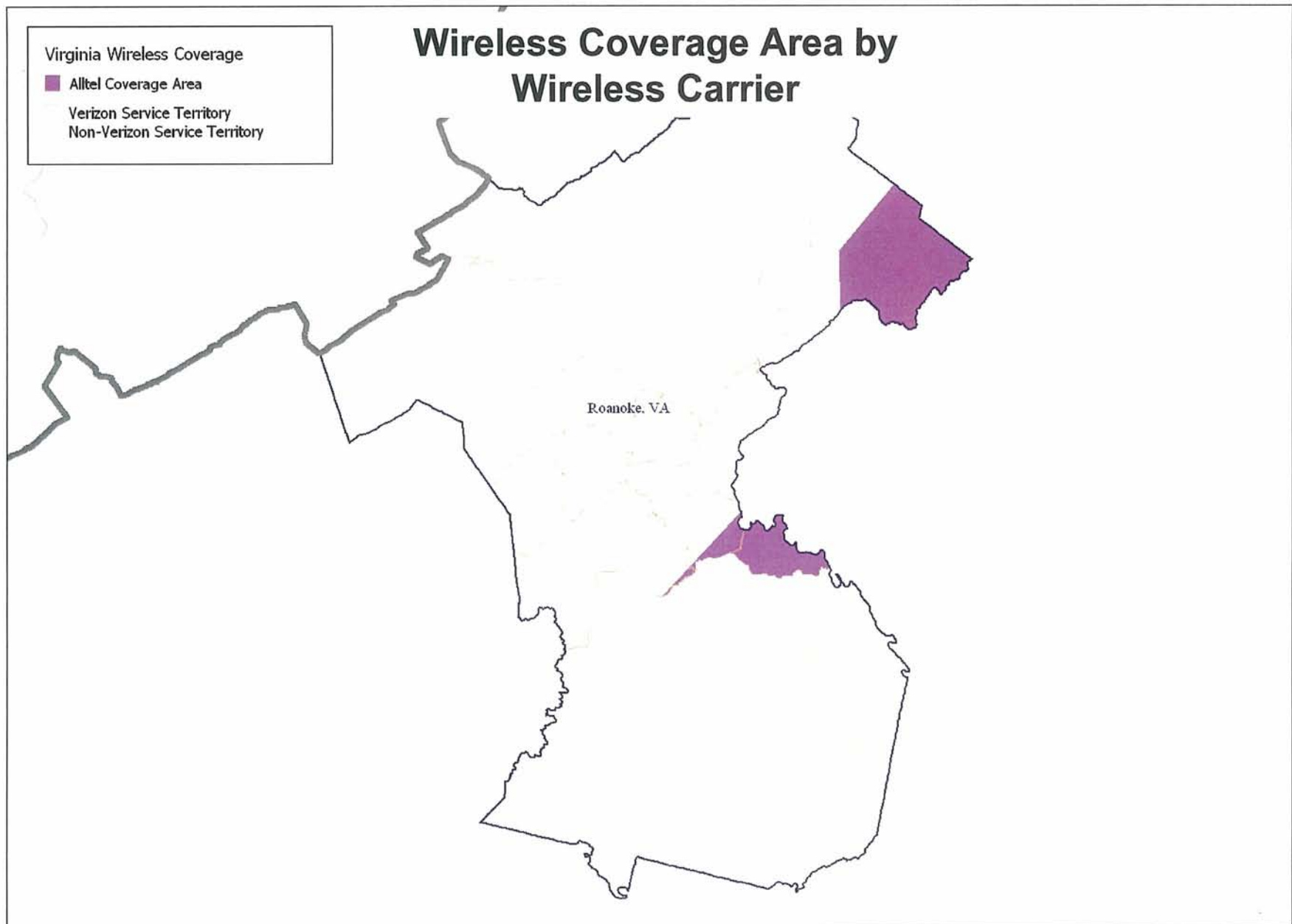


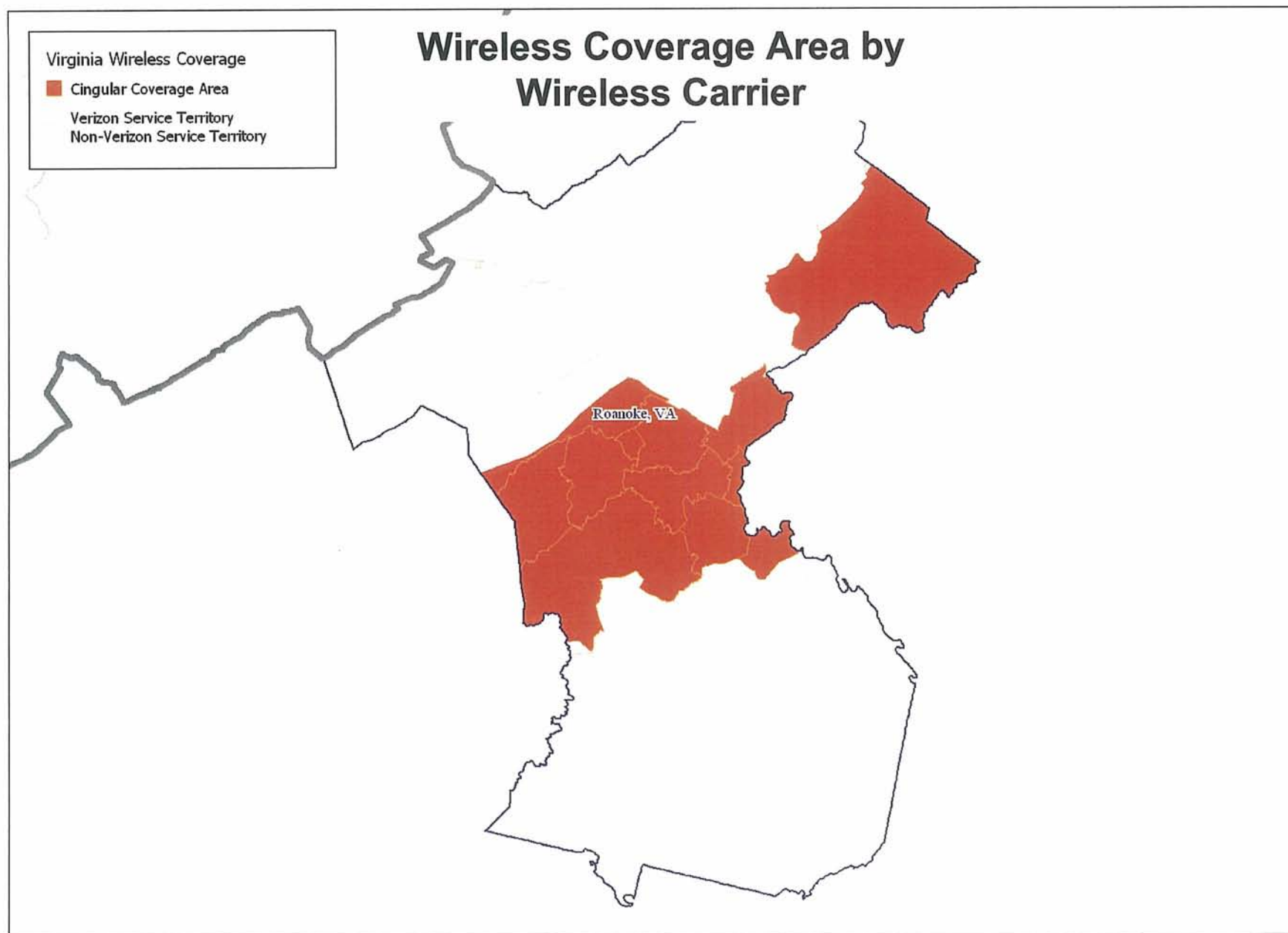
Exhibit ROA-10

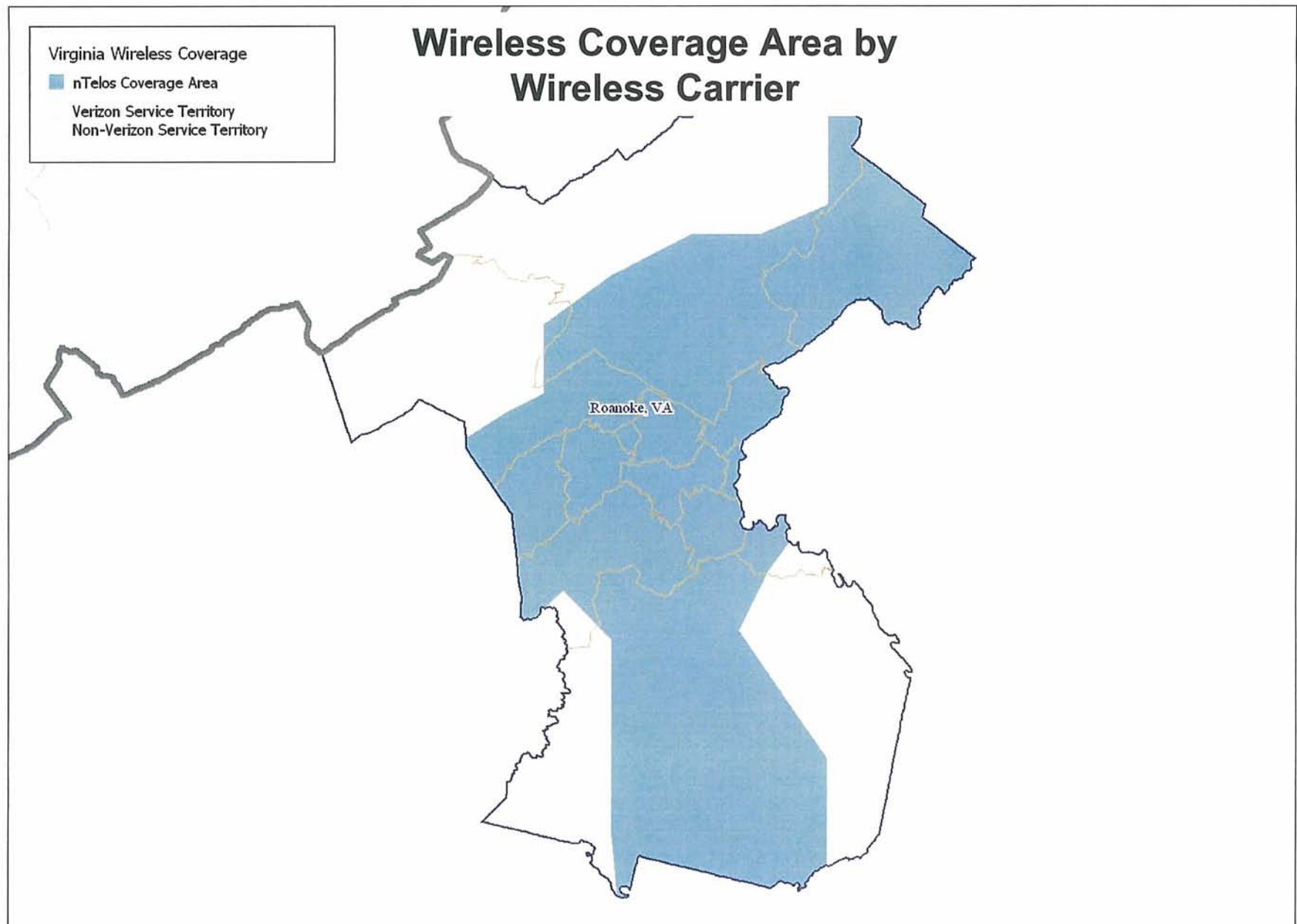
**ROA-11**

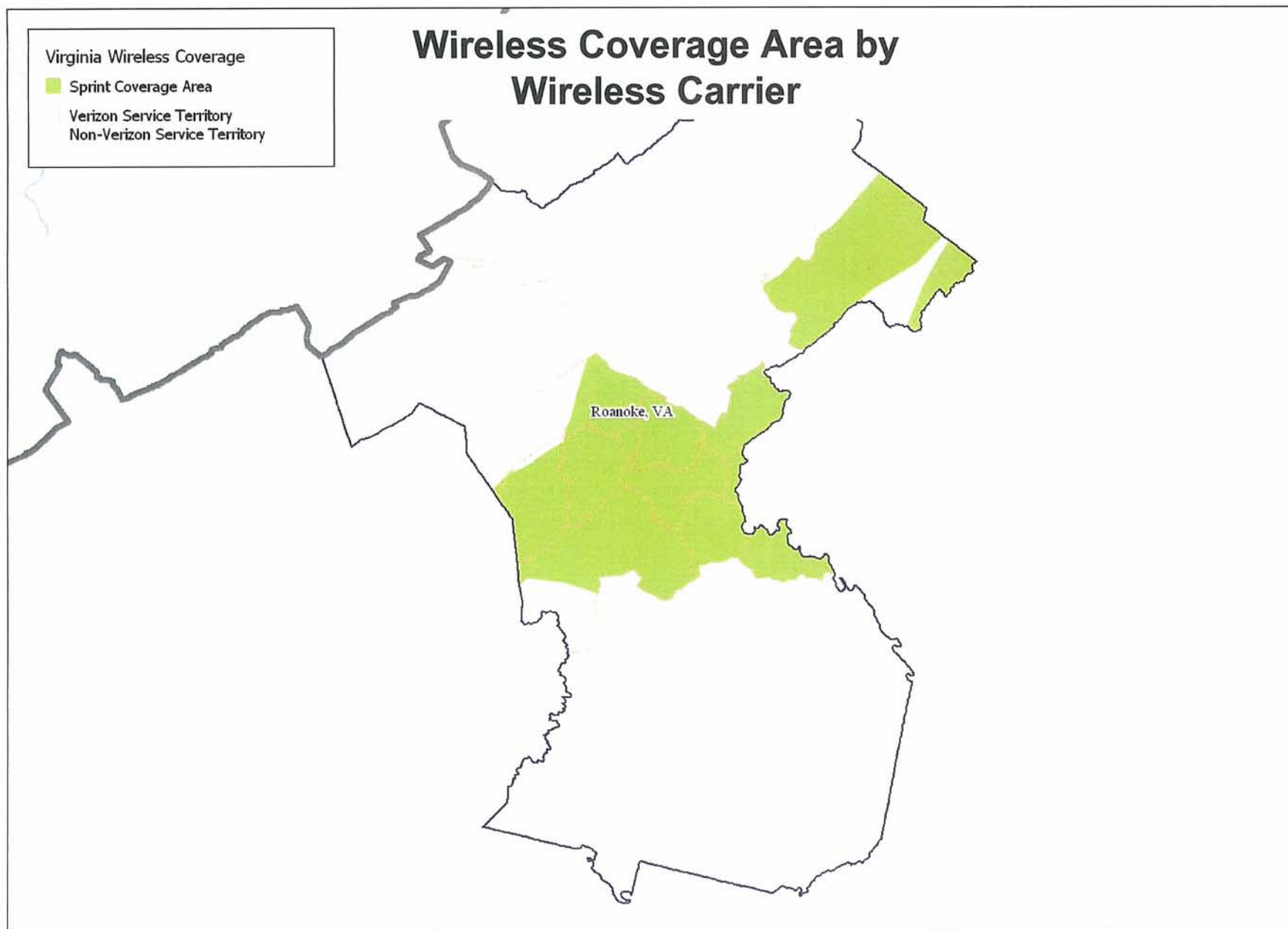
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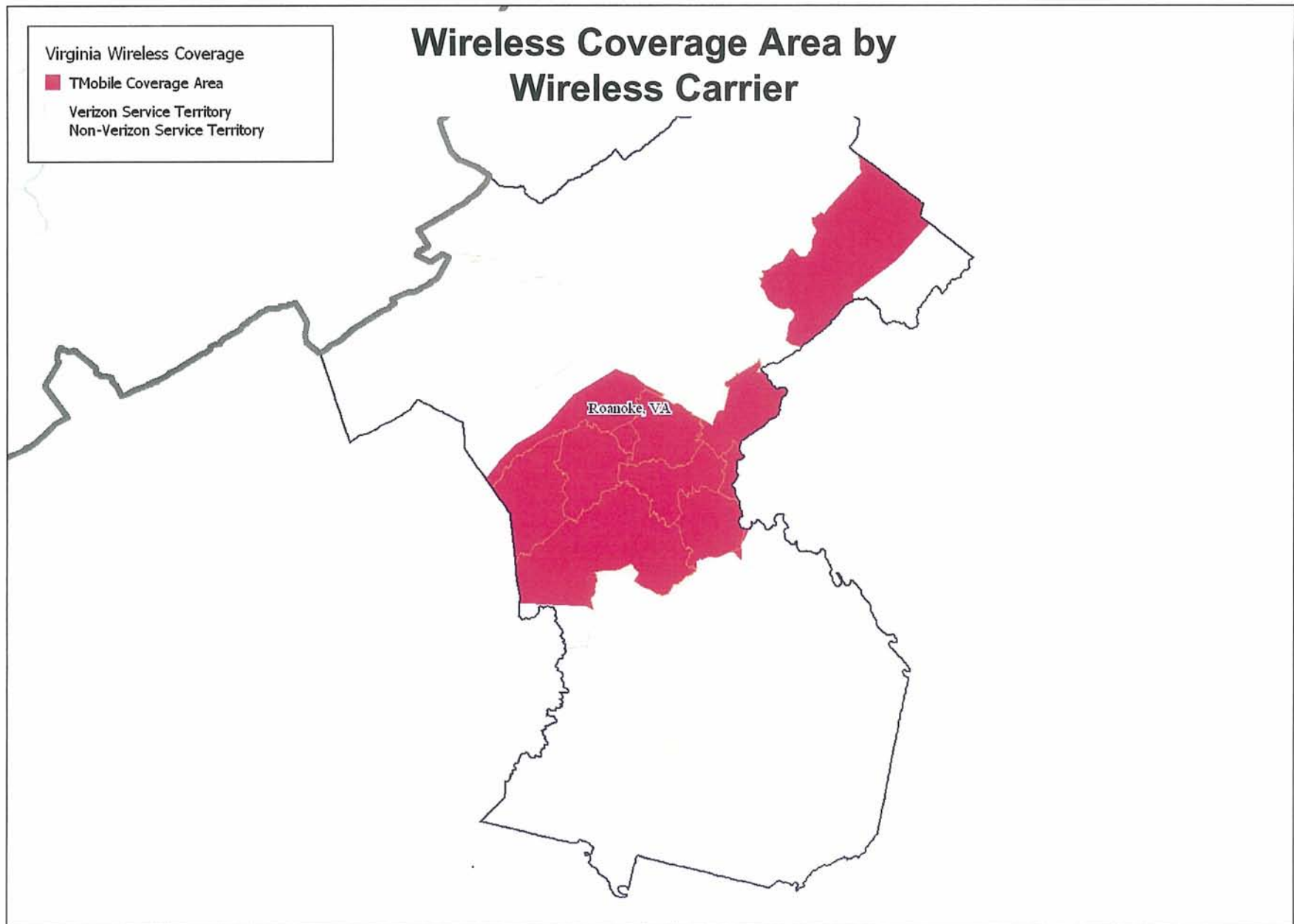


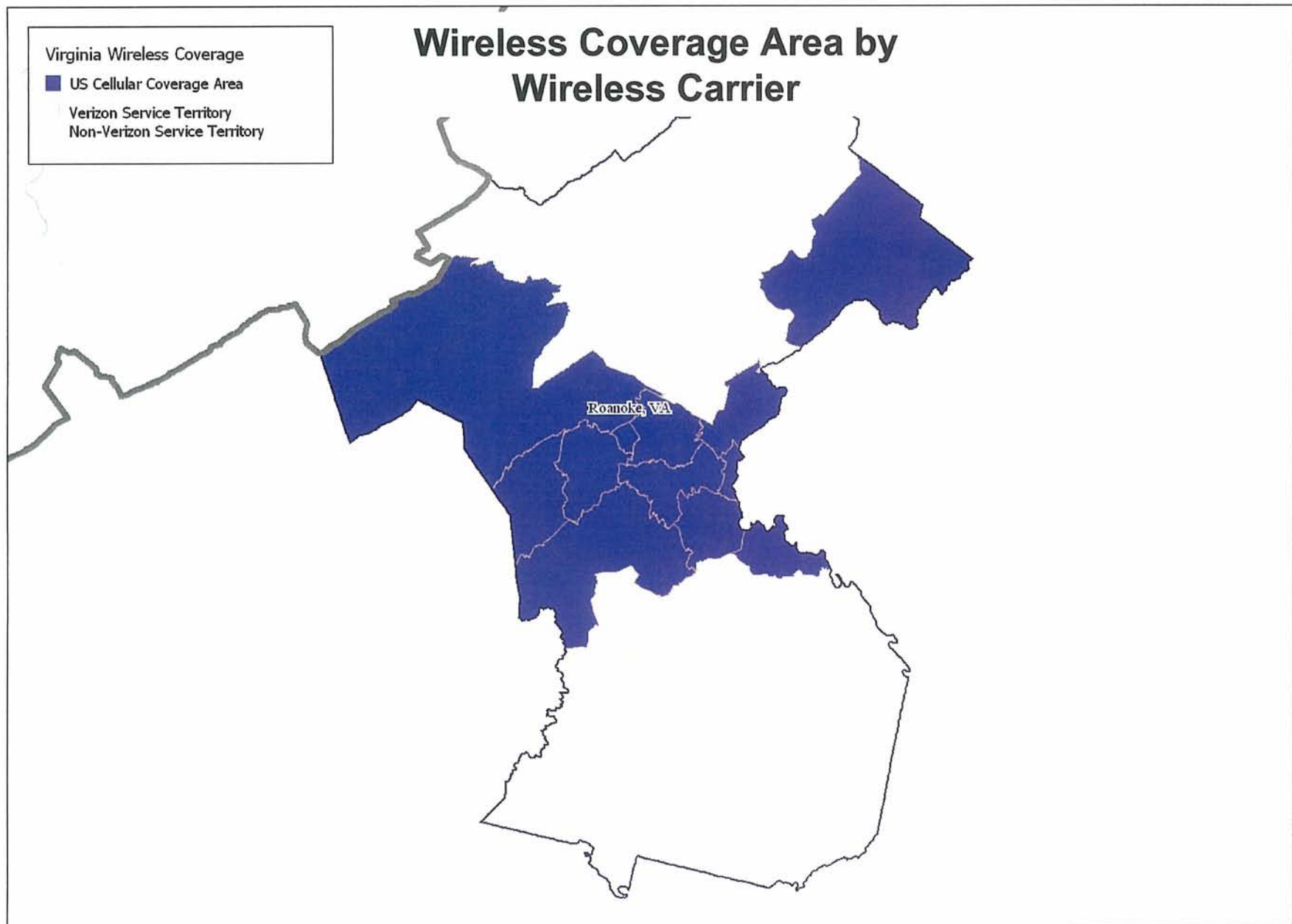


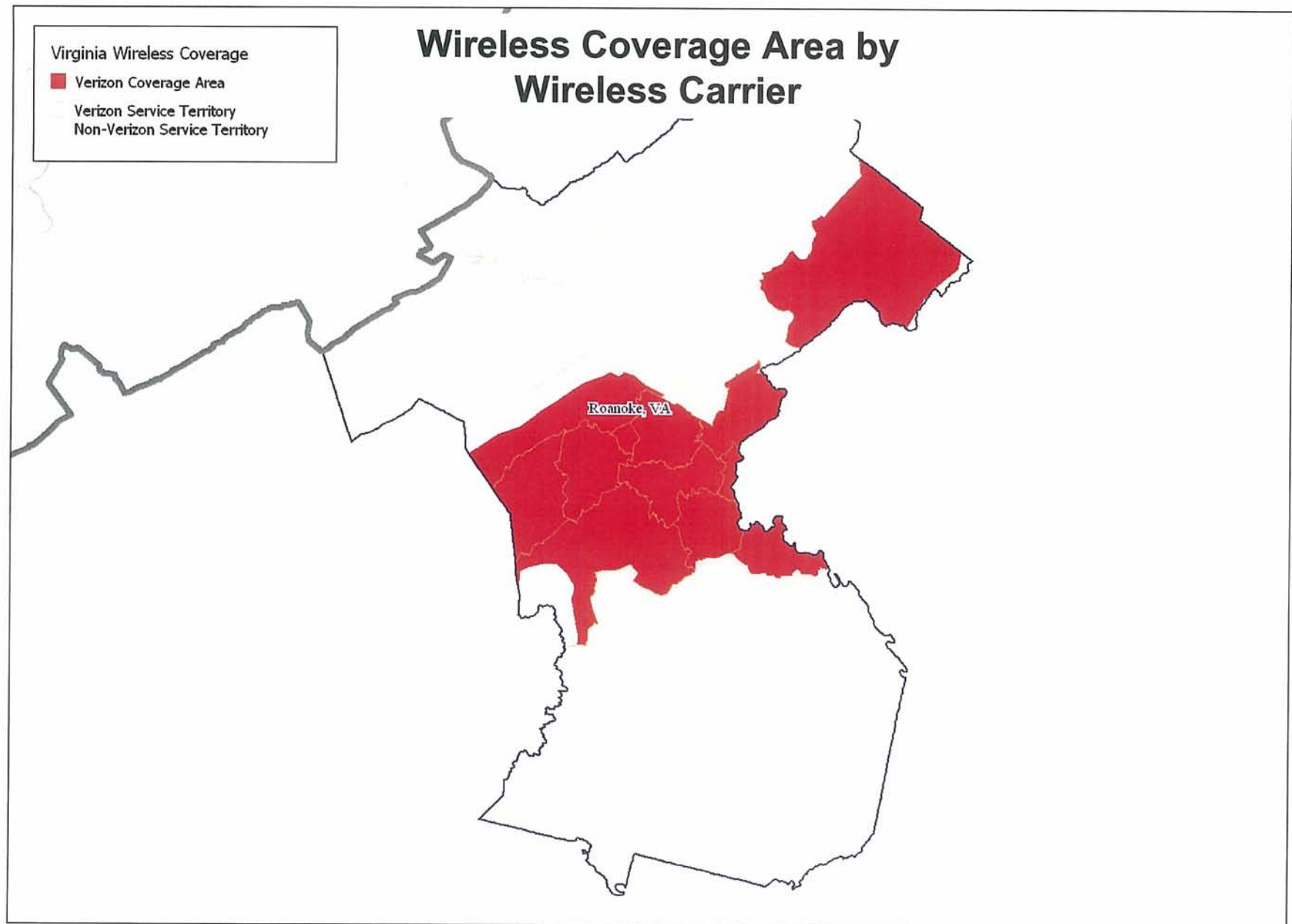










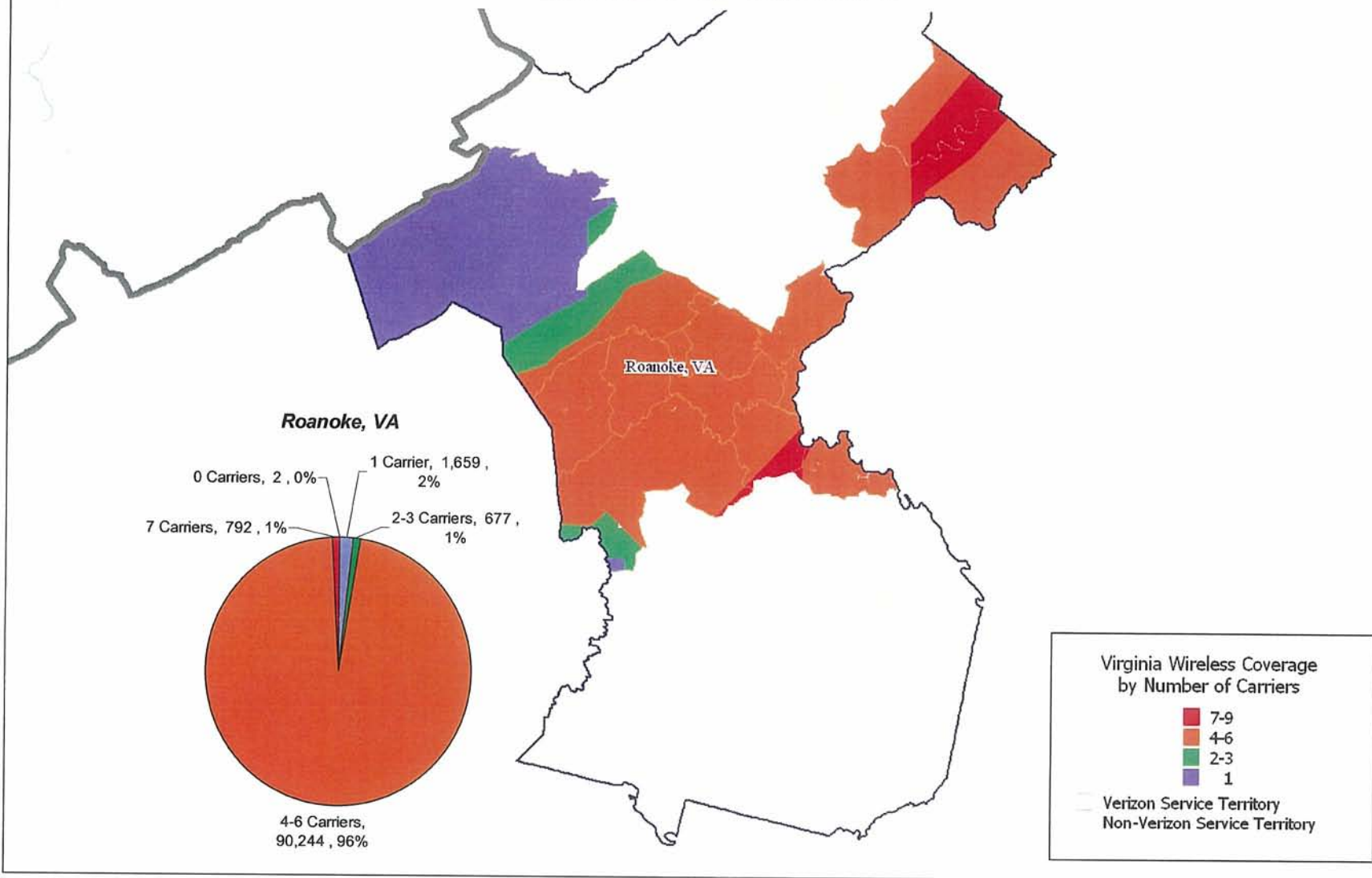


**ROA-12**

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## Wireless Coverage Area by Number of Carriers



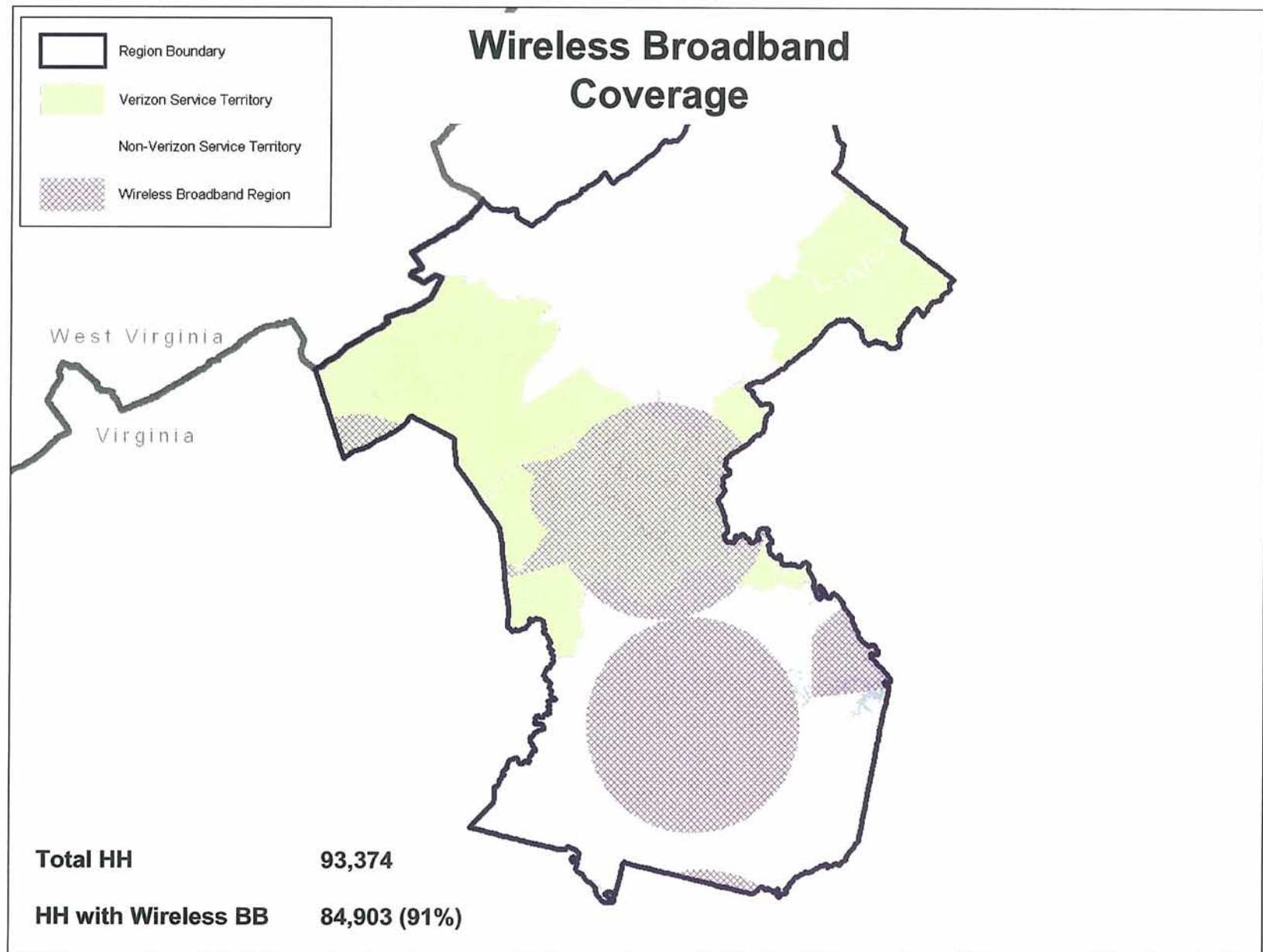
**Exhibit ROA-12**

Note: HH numbers reflect only those households in Verizon's Service Territory



**ROA-13**

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**Exhibit ROA-13**

**ROA-14**

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**CONFIDENTIAL**

**EXHIBIT** ROA-14

**ROA-15**

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# CONFIDENTIAL

## EXHIBIT ROA-15



**ROA-16**

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**CONFIDENTIAL**  
EXHIBIT ROA-16

**ROA-17**

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**CONFIDENTIAL**

**EXHIBIT** ROA-17

**ROA-18**

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**CONFIDENTIAL**  
**EXHIBIT** ROA-18



## Competitive Switch Reach

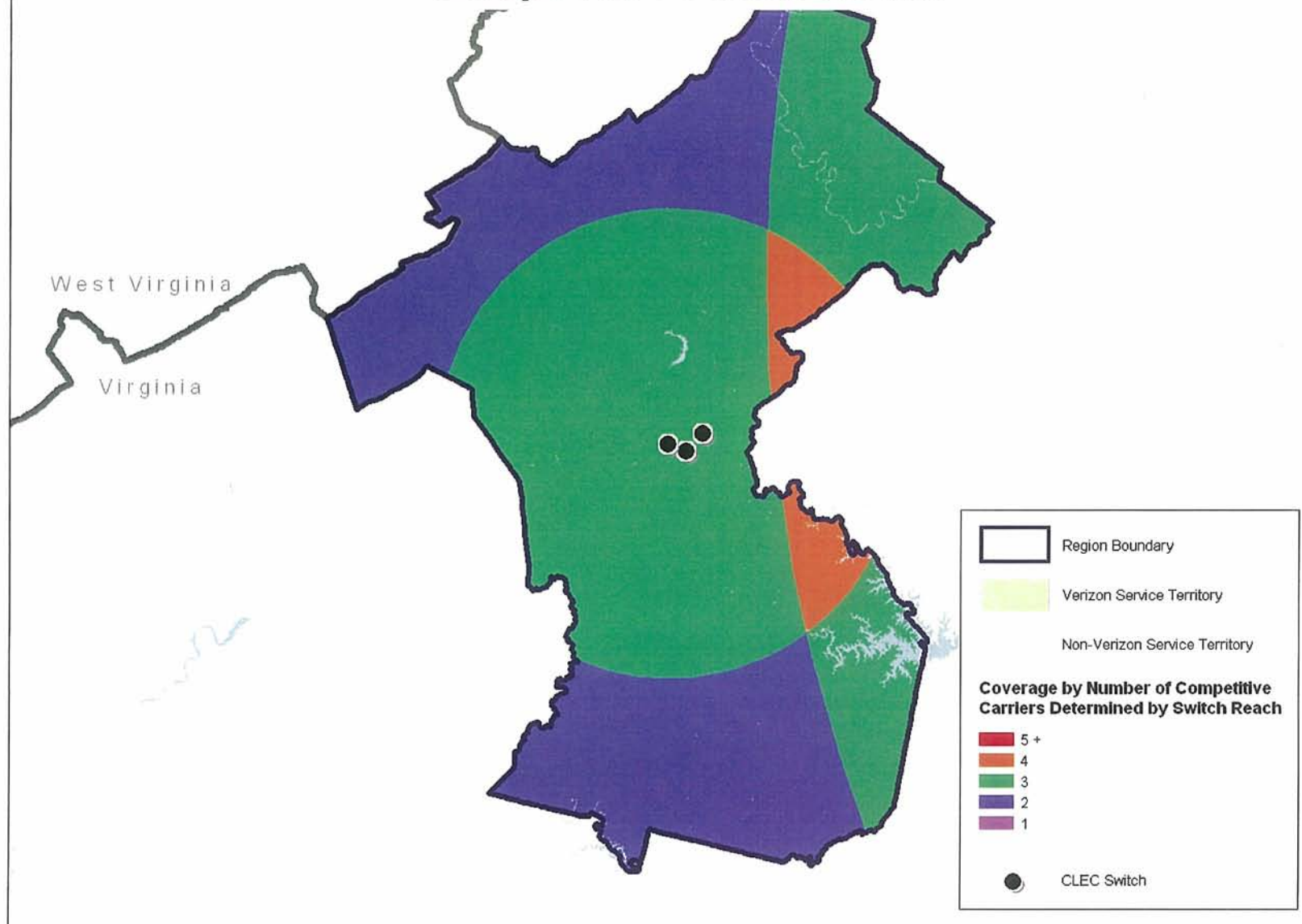


Exhibit ROA-18

Confidential

# ROA-19

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CONFIDENTIAL

EXHIBIT ROA-19